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### Special Article - Analytical living cost indexes for selected Australian household types (Jun, 2001)

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#### SUMMARY

This article presents analytical price indexes designed specifically to measure the impact of changes in prices on the out-of-pocket living costs experienced by four categories of Australian households. The indexes have been constructed to cover the period from June quarter 1998 up to and including the December quarter 2000.

Using the principal source of household income to categorise households, the four household types for which these indexes have been constructed are: Employee households, Age pensioner households, Other government transfer recipient households, and Self-funded retiree households.

These indexes represent the conceptually preferred measures for assessing the impact of changes in prices on the disposable incomes of households. In other words, these indexes are particularly suited for assessing whether the disposable incomes of households have kept pace with price changes or not. The Australian Consumer Price Index (CPI), on the other hand, is designed specifically to measure price inflation for the household sector as a whole and, as such, is not the conceptually ideal measure for assessing the impact of price changes on the disposable incomes of households.

The differences between indexes designed to measure price inflation and indexes designed to measure changes in living costs lie only in the item coverage. The item coverage of living cost indexes is determined by reference to all those amounts actually paid by households to gain access to consumer goods and services, while the item coverage of inflation indexes is defined as all those goods and services actually acquired by households in monetary transactions. The most notable differences are that living cost indexes include interest charges but do not include house purchases, while inflation indexes do not include interest charges but do include house purchases.

Over the two and a half years covered by these indexes, changes in living costs ranged from a low of 7.5% (experienced by Self-funded retiree households) to a high of 8.7% (experienced by Other government transfer recipient households). The CPI increased by 8.5% over the same period.

Feedback on these indexes is welcome. The ABS will update the indexes annually, around May of each year.

#### BACKGROUND

There is no single correct way to construct a consumer price index - with at least three widely accepted alternative approaches used by national statistical agencies. As these different approaches are best suited to answering different questions, the selection of approach is tied most closely to the principal use to be made of the index.

Historically, the principal use of the Australian CPI was as an input to wage and salary determination processes. Consistent with this requirement, the CPI was designed to measure changes in the living costs of wage and salary earner households.

To ensure that the Australian CPI continues to meet community needs, the ABS maintains a program of periodic public reviews. During the course of the last such review in 1997, it became clear that the principal requirement of the CPI had moved away from an input to wage and salary determination processes to a general measure of price inflation. Accordingly, commencing with the September quarter 1998, the CPI has been designed specifically to measure price inflation for the household sector as a whole.

During the consultations leading up to the decision to alter the design objective of the CPI, various users argued that there was a continuing need for a measure of changes in living costs. In fact, some argued that there were grounds for believing that different household types experienced significantly different rates of change in living costs and therefore there was a need for several living cost indexes. In response, the ABS decided that

... in recognition of the widespread interest in the extent to which rates of change in the cost of living vary across different groups in the community, the ABS will compile and publish analytical indexes specifically designed to measure changes in living costs for a range of population subgroups. These indexes, which will be constructed using the outlays approach, will be published at approximately annual intervals. ( **Information Paper: Outcome of the 13th Series Australian Consumer Price Index Review**, Cat. no. 6453.0, para 26, p.7)

## THE POPULATION SUBGROUPS

Principal source of income<sup>1</sup> is considered to be the best means of defining household types in order to meet the requirements for living cost indexes. Four household types have been identified as being appropriate for the construction of these indexes, namely:

- Employee households (i.e. those households whose principal source of income is from wages and salaries<sup>2</sup>);
- Age pensioner households (i.e. those households whose principal source of income is the age pension or veterans affairs pension<sup>3</sup>);
- Other government transfer recipient households (i.e. those households whose principal source of income is a government pension or benefit other than the age pension or veterans affairs pension) and,
- Self-funded retiree households (i.e. those households whose principal source of income is superannuation or property income and where the Household Expenditure Survey (HES) defined reference person is 'retired' (not in the labour force and over 55 years of age) ).

The estimated number of households in each of these household types and their relative significance based on the 1998-99 HES is shown in table 1.

**TABLE 1 POPULATION SUBGROUPS**

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Population subgroup	'000	% of total
Employee	4,095.4	57.5
Age pensioner	1,028.9	14.4
Other government transfer recipient	992.5	13.9
Self-funded retiree	318.1	4.5
Other households(a)	688	9.7
Total	7,122.8	100

(a) Includes self employed, income indeterminate and parent supported students.

Source: Household Expenditure Survey, 1998-1999.

## DIFFERENCES BETWEEN “LIVING COST” AND “INFLATION” INDEXES

The differences between indexes designed to measure price inflation and indexes designed to measure changes in living costs lie only in the item coverage.

A living cost index is intended to be used to assess changes over time in the purchasing power of the after-tax incomes of households. It is therefore concerned with measuring the impact of changes in prices on the out-of-pocket expenses incurred by households to gain access to consumer goods and services. The item coverage of such an index is determined by reference to the actual money outlays of households on all but investment items. On the other hand, an inflation index is defined to cover all those goods and services actually acquired by households in monetary transactions.

The most notable differences are that living cost indexes include interest charges but do not include house purchases, while inflation indexes like the current CPI do not include interest charges but do include house purchases.

Insurance (other than health insurance) is also treated differently in the living cost indexes. The weight for insurance in the CPI relates to the net value of the service provided by the insurance company (in simple terms, the amount of premiums paid by households less the amounts reimbursed by way of claims<sup>4</sup>). In the living cost indexes, the weight relates to the gross value of insurance premiums paid by households.

## METHODOLOGY

Construction of the living cost indexes was essentially undertaken in three stages. Stage one was concerned with calculating weights representative of the expenditure patterns of the defined household types. Stage two involved identifying appropriate measures of price change for each of the expenditure weights. The third and final stage was to use the weights to aggregate or average the price change measures.

Item weights for the population subgroups were derived mainly from the HES<sup>5</sup>. However, unlike the CPI where weights are calculated separately for each of the eight capital cities, population subgroup weights were calculated at the national level only. This was necessary because the subgroup sample sizes at the capital city level were simply too small, for at least some groups, to produce reliable estimates at the capital city level. For this reason it is not possible to produce living cost indexes at the individual city level.

The measures of price change, with the exception of those for interest charges, were sourced

from the CPI. Price measures for interest charges have been maintained separately by the ABS on a basis comparable with those employed in the CPI prior to September quarter 1998.

While most item price indexes were constructed by direct reference to the equivalent CPI expenditure class indexes, some were constructed by reference to lower level CPI price data. The exceptions relate to those items where it is known that different household types face different prices, such as subsidised public transport fares for senior citizens.

Over time the ABS will progressively refine the methodology used to construct these indexes to better reflect other differences in prices that may be faced by different household types. An example is making allowances for the possibility that different household types make purchases at different outlet types.

## WEIGHTS

The indexes presented in this article were constructed using two sets of weights. The first set of weights, based on the 1993-94 Household Expenditure Survey (HES), was used to construct the indexes from June quarter 1998 to June quarter 2000. The second set of weights, based on the 1998-99 HES, was used to construct the indexes from June quarter 2000 to December quarter 2000. In other words, all indexes are linked at June quarter 2000.

For ease of exposition, the discussion of weights will be restricted to those used from June quarter 2000 (i.e. those based on the 1998-99 HES). Table 2 shows per household average weekly expenditure during 1998-99 for each of the four population subgroups, at June quarter 2000 prices. The commodity grouping used corresponds to the commodity groups used for the current (14<sup>th</sup> series) CPI.

**TABLE 2 ESTIMATED AVERAGE WEEKLY EXPENDITURE DURING 1998-99 BY COMMODITY GROUP AND POPULATION SUBGROUP AT JUNE QUARTER 2000 PRICES**

Commodity group	Population subgroup			
	Employee	Age pensioner	Other government transfer recipient	Self-funded retiree
Average weekly expenditure per household (\$)				
Food	155.26	73.79	95.53	109.27
Alcohol and tobacco	74.16	25.31	41.58	44.17
Clothing and footwear	47.12	21.79	26.49	34.16
Housing	96.3	48.47	88.76	69.41
Household furnishings, supplies and services	71.47	36.45	34.12	75.3
Health	38.68	23.38	12.26	56.36
Transportation	139	38.54	58.11	87.87
Communication	24.2	10.3	18.66	15.57
Recreation	109.46	38.9	48.09	105.12
Education	22.78	0.48	10.1	1.53
Miscellaneous(a)	113.81	23.95	37.89	42.62
Total	892.25	341.35	471.61	641.39
Number of households ('000)	4,095.4	1,028.9	992.5	318.1
Persons/household (no)	2.94	1.55	2.68	1.6

(a) Includes interest charges and general insurance.  
Source: Household Expenditure Survey, 1998-1999.

Table 2 illustrates significant differences in expenditures, both in total and at the individual commodity group level. Although differences in incomes could largely account for these differences, other factors such as the demographic make-up of the households and dwelling tenure would also play a part. For example, Age pensioner households have on average the lowest number of persons per household, being mostly one or two person households without children, while Employee and Other government transfer recipient households are more likely to include dependent children. In addition, the higher rate of outright home ownership among certain subgroups, such as Self-funded retiree and Age pensioner households, would also influence the nature of expenditures.

For purposes of constructing price indexes over time it is not the absolute expenditure levels but rather the expenditure shares (or weights) that matter. Table 3 presents the same data in expenditure share (or weight) form.

**TABLE 3 EXPENDITURE WEIGHTS BY MAJOR COMMODITY GROUP AND POPULATION SUBGROUP AT JUNE QUARTER 2000 PRICES**

Commodity group (a)	Population subgroup			
	Employee	Age pensioner	Other government transfer recipient	Self-funded retiree
Proportion of total expenditure (%)				
Food	17.4	21.62	20.26	17.04
Alcohol and tobacco	8.31	7.42	8.82	6.89
Clothing and footwear	5.28	6.38	5.62	5.33
Housing	10.79	14.2	18.82	10.82
Household furnishings, supplies and services	8.01	10.68	7.24	11.74
Health	4.33	6.85	2.6	8.79
Transportation	15.58	11.29	12.32	13.7
Communication	2.71	3.02	3.96	2.43
Recreation	12.27	11.39	10.2	16.39
Education	2.55	0.14	2.14	0.24
Miscellaneous(b)	12.76	7.02	8.03	6.65
Total	100	100	100	100

(a) Figures may not add due to rounding.

(b) Includes interest charges and general insurance.

Source: Household Expenditure Survey, 1998-1999.

There are notable differences in the expenditure weights across the population subgroups. For example the proportion of expenditure allocated to Food is highest for Age pensioner households, closely followed by Other government transfer recipient households. Employee households allocate a higher proportion of their expenditures to Transportation, Education and Miscellaneous (which includes interest charges) than the other household groups. Other government transfer recipients allocate higher proportions of their expenditures to Housing and Alcohol and tobacco than the other population subgroups. Self-funded retirees allocate higher proportions of their expenditures to Transportation, Household furnishings and supplies, Health and Recreation than the other population subgroups.

Further insight into the differences in expenditure patterns is provided in Table 4. This table shows weights at the equivalent of the 14th series CPI expenditure class level for those

expenditure classes where the differences in weights are most pronounced. The differences across the population subgroups again highlight the demographic and other differences among the population subgroups, some of which have been noted above.

**TABLE 4 EXPENDITURE WEIGHTS FOR SELECTED EXPENDITURE CLASSES AT JUNE QUARTER 2000 PRICES**

Expenditure class	Population subgroup				
	CPI	Employee	Age pensioner	Other government transfer recipient	Self-funded retiree
	Proportion of total expenditure (%)				
Rents	5.6	5.15	4	12.82	0.47
Interest charges (a)	0	6.58	0.45	2.78	0.36
Hospital and medical services	2.71	2.48	3.89	1	5.86
Tobacco	2.27	2.45	2.37	4.88	1.56
Domestic holiday travel and accommodation	2.4	2.43	3.49	1.31	4.51
House repairs and maintenance	1.85	1.56	3.01	1.16	4.3
Motor vehicles	5.85	6.26	3.17	3.65	6.21
Overseas holiday travel and accommodation	1.95	1.67	1.35	0.84	3.17
House purchase (b)	7.86	0	0	0	0

(a) Not included in the CPI.

(b) Not included in the population subgroup indexes.

Source: Household Expenditure Survey, 1998-1999.

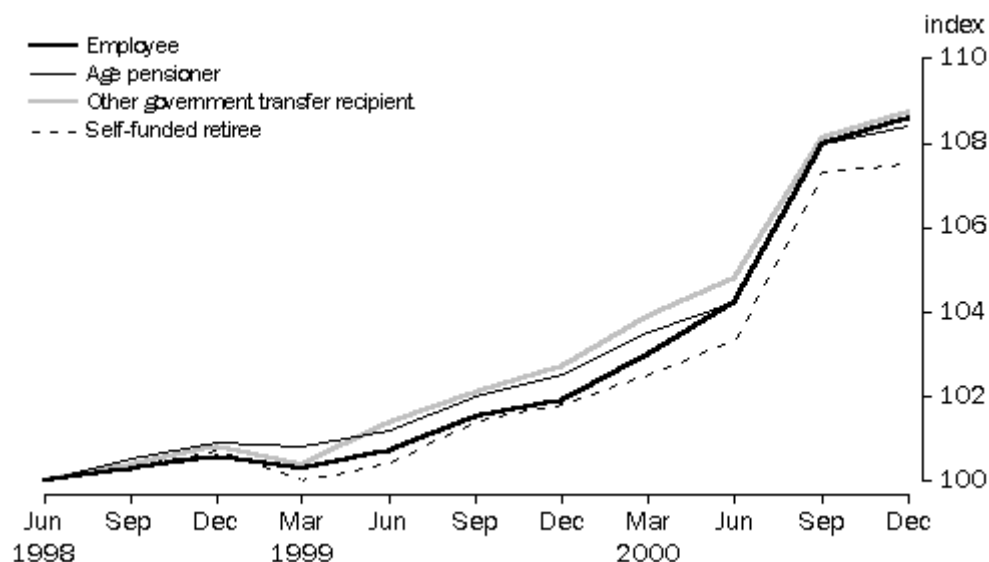
When comparing differences in the behaviour of the aggregate indexes, the role played by differences in weights increases as the dispersion in the rates of price change increases. Over the period for which these indexes have been compiled there is substantial dispersion in the price movements of the expenditure classes. For example the CPI index for Hospital and medical services declined by 10.1% between the June quarter 1998 and the December quarter 2000 while the index for Tobacco increased by 28.2% over the same period.

## RESULTS

The index series for the various population subgroups from June quarter 1998 to June quarter 2000 are shown in chart 1 and quarterly percentage changes in the indexes in chart 2. The data on which the charts are based are provided in table 5.

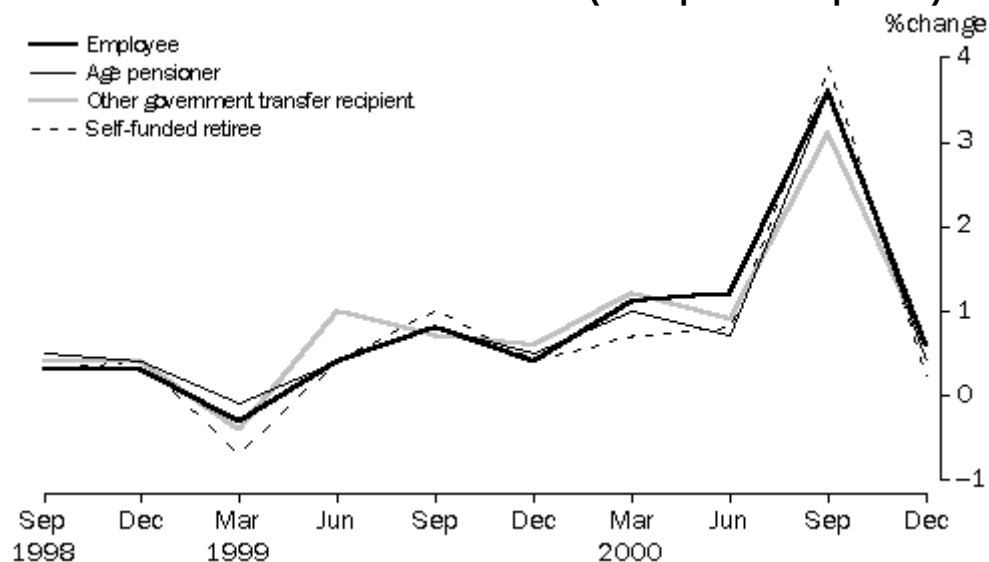
Differences in movements in the aggregate indexes reflect both differences in the prices of items and differences in expenditure patterns across the population subgroups. If prices of all items showed the same movement then differences in expenditure patterns would have no effect on the indexes. As noted earlier, the greater the dispersion in price movements between items, the more important differences in the weights become.

**CHART 1: INDEX NUMBERS BY POPULATION SUBGROUP, June quarter 1998 = 100.0**



Some of these differences in prices and weights are observable in the profile of the analytical indexes. For example, the drop in the indexes in the March quarter 1999 coincides with the introduction of the rebate on health insurance. This would in part contribute to the larger decline in the index for Self-funded retiree households than other population subgroups, as these households have greater proportional expenditure on health insurance. Rises in mortgage interest charges from the December quarter 1999 had a greater impact on the Employee households index than on the other indexes, due to a greater proportional expenditure on mortgage interest by that subgroup.

**CHART 2: PERCENTAGE CHANGE (from previous quarter)**



**TABLE 5 POPULATION SUBGROUP INDEXES AND PERCENTAGE CHANGES**

Quarter	Employee	Age pensioner	Other government transfer recipient	Self-funded retiree	CPI(a)
Index numbers					
June quarter 1998 = 100.0				1989-90 = 100.0	

June	100	100	100	100	121
September	100.3	100.5	100.4	100.3	121.3
December	100.6	100.9	100.8	100.7	121.9
1999					
March	100.3	100.8	100.4	100	121.8
June	100.7	101.2	101.4	100.4	122.3
September	101.5	102	102.1	101.4	123.4
December	101.9	102.5	102.7	101.8	124.1
2000					
March	103	103.5	103.9	102.5	125.2
June	104.2	104.2	104.8	103.3	126.2
September	108	108	108.1	107.3	130.9
December	108.6	108.4	108.7	107.5	131.3

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% change on previous period

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1998					
September	0.3	0.5	0.4	0.3	0.2
December	0.3	0.4	0.4	0.4	0.5
1999					
March	-0.3	-0.1	-0.4	-0.7	-0.1
June	0.4	0.4	1	0.4	0.4
September	0.8	0.8	0.7	1	0.9
December	0.4	0.5	0.6	0.4	0.6
2000					
March	1.1	1	1.2	0.7	0.9
June	1.2	0.7	0.9	0.8	0.8
September	3.6	3.6	3.1	3.9	3.7
December	0.6	0.4	0.6	0.2	0.3

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% change June quarter 1998 to December quarter 2000

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8.6	8.4	8.7	7.5	8.5
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(a) The CPI is designed to measure price inflation for the household sector and not changes in living costs.

All the indexes record an increase between the June and September quarters 2000, which is mainly attributable to the introduction of The New Tax System (TNTS). The population subgroup indexes rose by between 3.1% (Other government transfer recipient households) and 3.9% (Self-funded retiree households) while the CPI increased by 3.7%. However, it should be noted that these indexes are only concerned with measuring changes in prices of goods and services and do not take into account any increases in disposable incomes flowing from reductions in income taxes and increases in social security benefits arising from the introduction of TNTS.

Between the December quarters 1999 and 2000 the increases in the population subgroup indexes ranged from 5.6% for Self-funded retiree households to 6.6% for Employee households. The increase in the CPI over the same period was 5.8%.

## CONCLUSIONS

These analytical indexes have been designed specifically to answer the question:

**“By how much would after-tax money incomes need to change to allow households to purchase the same quantity of consumer goods and services as purchased in the base period?”**

Over the two and a half years covered by these indexes, the answers would appear to be broadly similar across the different household types; ranging from a low of 7.5% (for Self-funded retiree



households) to a high of 8.7% (for Other government transfer recipient households). The CPI recorded an increase of 8.5% over the same period so, even though it is not specifically designed to do so, it provided a reasonable estimate of changes in living costs for the population as a whole. However, these results might not hold over all time periods.

In considering these results it is important to recognise that these indexes have been constructed to reflect the experiences of population groups as a whole, and they may not reflect the experiences of any individual household. In this regard it is particularly important to note that no such index can be expected to reflect the changes in living costs experienced by households as a direct consequence of their moving through the life cycle (e.g. as a result of family formation and ageing). These indexes measure the changes in living costs that would be experienced by a group of households with fixed characteristics (e.g. fixed numbers of persons, of fixed age etc).

## FURTHER INFORMATION

Comments on, or questions about the indexes should be directed to

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## ENDNOTES

1 A household's principal source of income is defined as that income source which accounts for the largest proportion of total income. It is not necessary that the principal source accounts for a majority of household income. For example, if a household's income can be sourced 40% from wages and salaries, 35% from property income and 25% from an age pension, it would be classified as an Employee household.

2 The definition of Employee households used in this article does not correspond to that for wage and salary earner households used to construct the CPI prior to September quarter 1998.

3 The definition of Age pensioner households used in compiling the indexes in this article is broader than that used in previous studies of a similar nature; in particular, income cut-offs have not been applied.

4 For more detail refer to Keith Woolford, '**Treatment of Insurance Services in the Australian Consumer Price Index**', **Australian Economic Indicators, October 2000** (Cat. No. 1350.0).

5 As is the case in deriving weights for the CPI, HES data are adjusted where necessary; for example to account for known under reporting of expenditure on items like alcohol and tobacco.

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